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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,350	11/09/2001	Suk-Kyun Lee	29347/597	1665

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EXAMINER
NGUYEN, DAO H

ART UNIT	PAPER NUMBER
2818	

DATE MAILED: 08/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/045,350	LEE, SUK-KYUN
	Examiner	Art Unit
	Dao H Nguyen	2818

-- Th MAILING DATE of this communication app ars on the cover sheet with th correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 March 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 November 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. In response to the communications dated 03/03/2003, claims 1-10 are active in this application as a result of the cancellation of claims 11-17.

Acknowledges

2. Receipt is acknowledged of the following items from the Applicant.

Applicant made a provisional election without traverse to prosecute the invention of Group I, claims 1-10, and a cancellation of Group II, claims 11-17. Affirmation of the election and cancellation was made in the Response to Restriction Requirement filed 03/03/2003 and made of record as Paper No. 4.

Applicant has the right to file a divisional application covering the subject matter of the non-elected claims.

Foreign Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

4. The drawings are objected to for the following reasons.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the bipolar element formed in a third region of the substrate must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings, showing changes in red ink, are required in reply to the Office Action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. However, formal correction of the noted defect(s) can be deferred until the application is allowed by the examiner (see MPEP § 608.02v).

Specification

5. The specification has been checked to the extent necessary to determine the presence of possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim(s) 4 is/are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 is not clearly defined and distinctly pointed out the subject matter which is claimed as the Applicant's invention. How can a part of the source region overlaps a portion of the slanted side walls? As shown in all figures, the slanted side wall and the source region are separated by a field oxide layer. There is no way for, technically, a side wall of the gate electrode being overlapped by a source region.

Claim Rejections - 35 U.S.C. § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claim(s) 1-3, and 5-10 is/are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 4,536,945 to Gray et al., in view of U.S. Patent No. 6,015,991 to Wheeler et al., and further in view of the following remarks.

Regarding claim 1, Gray discloses a semiconductor element, as shown in figures 1, 3, 12, 14, comprising:

a substrate 10;

a first MOS element p-channel transistor formed on a first portion of the substrate 10 having a gate electrode 38; and

another MOS element n-channel transistor formed on a second portion of the substrate 10 that is separate from the first portion.

Gray does not teach that the first MOS element being a DMOS element, nor that it includes a gate electrode having slanted side walls.

Wheeler discloses a MOS transistor structure, as shown in figures 1, 9, comprising a gate electrode 51 having slanted side walls 56.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the p-channel transistor of Gray so that it would have a gate electrode as that of Wheeler in order to reduce the hot carrier injection into the gate oxide, therefore improving the reliability of the device. See column 3, lines 26-33 of Wheeler.

In addition, it would have been obvious to one having ordinary skill in the art at the time the invention was made that the first MOS element of Gray/Wheeler could be a DMOS or any other MOS element, since all of such elements would make the device work equally well, and that none of such of element would make any change in the spirit and scope of the invention of Gray/Wheeler.

Regarding claim 2, Gray/ Wheeler disclose the semiconductor element, wherein the slanted side walls of the gate electrode of the first DMOS element and side walls of a gate electrode of the first MOS element have different profiles. See figure12 of Gray and figure 1B of Wheeler.

Regarding claim 3, Gray/ Wheeler disclose the semiconductor element, wherein the first DMOS element includes:

a well 10 of a first conductive type p-type formed on the substrate 10a (figure 6 of Gray);

a body region 30 of a second conductive type n-type formed in the well 10;

a source region 43 of the first conductive type p-type formed in the body region 30;

a drain region 43 of the first conductive type p-type formed in the well and spaced from the source region; and

a gate insulating layer 21 formed between the well 30 and the gate electrode 38. See figures 6, and 12 of Gray.

Regarding claim 5, Gray/ Wheeler disclose the semiconductor element, wherein the first MOS element includes:

a well 31 of a first conductive type p-type formed on the substrate;

a source region 41 of a second conductive type n-type formed in the well;

a drain region 41 of the second conductive type formed in the well;

a gate electrode 39 formed on the well 31 of the first conductive type; and

a gate insulating layer 21 interposed between the gate electrode 39 and the well 31 of the first conductive type. See figures 6, 12 of Gray.

Regarding claim 6, Gray/ Wheeler disclose the semiconductor element, wherein a gate insulating layer of the first DMOS element includes a relatively thicker portion. See figures 3-11 of Gray.

Regarding claim 7, Gray/ Wheeler disclose the semiconductor element, further comprising a protection layer 45 having all claimed limitations. See figures 10-14 of Gray.

Regarding claims 8 and 9, Gray/ Wheeler disclose the semiconductor element comprising all claimed limitations, except for a second DMOS element formed on the substrate opposing the first DMOS element, and a second MOS element formed on the substrate opposing the first MOS element.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to expand the invention of Gray/Wheeler to create the device in plurality form, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. St. Regis Paper Co. v. Bemis Co., 193 USPQ 8.

Regarding claim 10, Gray/ Wheeler disclose a semiconductor element, as shown in figures 1, 3, 12, 14, comprising:

a substrate 10/10a;

a DMOS element formed in a first region of the substrate, wherein the DMOS element includes a gate electrode having slanted side walls;

a CMOS element formed in a second region of the substrate; and

a bipolar element or bipolar transistor formed in a third region of the substrate 10/10a. See figure 12 of Gray and see also the rejection of claim 1 above.

Conclusion

10. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao H. Nguyen whose telephone number is (703) 305-1957. The examiner can normally be reached on Monday-Friday, 9:00 AM – 6:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (703) 308 - 4910. The fax numbers for

Customer Service is (703) 872-9317, for the organization where this application proceeding is assigned is (703) 872-9318 for regular (Before Final) communications or (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Dao H. Nguyen
Art Unit 2818
August 04, 2003

HOAI HO
PRIMARY EXAMINER